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केन्द्रीय माध्यमिक शिक्षा बोर्ड

(मानव संसाधन विकास मंत्रालय, भारत सरकार, के अधीन एक स्वायत्त संगठन)

शिक्षा सदन, 17, इन्सटिट्यूशनल क्षेत्र, राउज एवेन्यु, दिल्ली–110002.

CENTRAL BOARD OF SECONDARY EDUCATION

(An Autonomous Organization under the Union Ministry of Human Resource Development, Govt. of India)

"Shiksha Sadan", 17, Institutional Area, Rouse Avenue, Delhi-110002

CBSE/Sc.Exh/Dir(Arti)/2013 **09.12.2013**

All Heads of Institutions **Circular No. Acad-77/2013**
affiliated to the Board

Subject: Organisation of CBSE Science Exhibition – 2014

Dear Principal

The Central Board of Secondary Education has been taking many initiatives to provide interactive, participatory, hands-on, innovative and creative learning experiences to students studying in its affiliated schools. One such initiative refers to the organisation of Science Exhibitions at Regional and National levels every year. The activity aims at providing a common platform to schools, teachers and students to give shape to their innovative ideas and learn from each other's experiences. These exhibitions also provide a medium for popularising Science and increasing awareness among stakeholders about the close relationship between Science, Technology and Society.

The main objectives of organising Science exhibitions can be summarised as:

- Promoting interest in Science and Technology among the youth.
- Providing a forum for children to pursue their natural curiosity, innovation and inventiveness to quench their thirst for creativity;
- Encouraging scientific and technological creativity among students and inculcating a sense of pride in their talent.
- Creating awareness that science and mathematics are all around us and we can gain knowledge as well as solve many problems by relating the learning process to the physical and social environment;
- Providing exploratory experiences, encouraging creative thinking and promoting psychomotor skills among school students through self-designed models or simple apparatus.
- Encouraging problem solving approach and developing appropriate technologies, especially for rural areas and integrating scientific ideas with daily life situations.
- Popularising Science and technology among masses and creating an awareness regarding its impact on socio-economic and sustainable development of the country.
- Emphasising on the development of science and mathematics as a major instrument for achieving goals of self-reliance and socio-economic and socio-ecological development;
- Analysing how science and mathematics have developed and are affected by many diverse individuals, cultures, societies and environment;

- Appreciating the role of science in meeting the challenges of life such as climate change, opening new avenues in the area of agriculture, fertiliser, food processing, biotechnology, green energy, disaster management, information and communication technology, astronomy, transport, games and sports etc.

- Creating awareness about environmental issues and concerns and inspire children to devise innovative ideas towards their mitigation.

Taking into consideration the enthusiastic response from participating schools in the past, it has again been decided to organise Science exhibitions for the year 2014. These exhibitions are likely to be organised in different parts of the country at **Regional level** in the month of **April/ May** and at **National Level** in the month of **July, 2014.**

The main theme and sub-themes for this year's exhibition are:

Main Theme: Scientific and Mathematical Innovations

Sub-themes: The five sub-themes are:

1) **Agriculture**
2) **Energy**
3) **Health**
4) **Environment**
4) **Resources**

Key aspects of the exhibition

How to register:

(i) All schools willing to participate may register on – line by paying a registration/ participation fee of INR. 650/-

(ii) Schools who are unable to register on-line may register by paying a participation fee of INR. 650/- in the form of a demand draft in favour of **Secretary, CBSE** payable at **New Delhi.** The request for participation alongwith the enclosed registration form and fee is to be sent to the following address super scribed 'Science Exhibition 2014' .

Dr. Kshipra Verma
Education Officer
Shiksha Sadan, CBSE
17, Rouse Avenue
Near Bal Bhawan
New Delhi

(iii) The last date for registration for participation in the **event is January 31, 2014.**

Rules for Participation:

(iv) The participating school can put up a **maximum of two exhibits/projects/models**.

(v) A school team may be represented by a **maximum of two students per exhibit** and one escort Science Teacher.

(vi) **School team participating at regional level and National level must remain the same**.

(vii) Students studying in **grade VI to XI** in the current academic year i.e. **2013-14** are eligible to participate.

(viii) The exhibit/project displayed and selected at regional level should be based on theme and sub theme selected.

(ix) The sub-theme once selected cannot be changed.

(x) Schools may rework on exhibit / project shortlisted at regional level for its display at national level. However they are **not allowed** to change the theme or sub theme of the selected / shortlisted exhibit.

(xi) The participating school/team will have to bear **all expenses** related to participation in the event.

(xii) The participating teams will have to make **their own lodging/boarding arrangements** at the venue city of exhibition.

How to prepare Models/ Projects:

(xiii) The exhibit/model may be either
   (a) A working model
   (b) An investigation-based project

(xiv) The exhibit/project may include
- working model to explain a concept, principle or a process
- an indigenous design of a machine/device
- an innovative/inexpensive design or technique
- application of basic principles of Science/Technology
- Scheme/design of a device or machine to reduce production cost
- Investigation based study

(xv) Greater emphasis may be given to investigation-based innovative projects to kindle scientific method and scientific approach in the students.

(xvi) A brief write-up about the main-theme and sub-themes is enclosed for reference. The participating teams may prepare the exhibits/projects on any one of the sub-themes satisfying one or more of the stated parameters.

(xvii) It is mandatory to submit a neatly typed brief write up (approximately 100 words) about the exhibit at regional as well as national level at the time of registration.

(xviii) The exhibits/projects will be **assessed** by the experts as per the following **criteria:**

a.	Students' own creativity and imagination	20%
b.	Originality and innovativeness in design of the exhibit/project	15%
c.	Scientific thought/principle	15%
d.	Technical skill/workmanship/craftsmanship	15%
e.	Utility/educational value	15%
f.	Economic aspect, portability, durability	10%
g.	Presentation -Explanation and demonstration	10%

General Guidelines:

(xix) The first stage of exhibition will be held at two/three different venues in every region.

(xx) The selected **best fifteen** exhibits/ schools at every regional level venue will be **eligible to participate** in the **National level exhibition**.

(xxi) The actual dates for the regional level exhibition will be communicated to every school and details will also be available on CBSE website **www.cbse.nic.in** by 15th March, 2014.

(xxii) Schools are advised to refer to FAQ's and CBSE's guidelines available on CBSE website.

(xxiii) Attractive awards/cash prizes are given to exhibits/students who present the best twenty models at the national level. (Further to inform you that winners of the National Level Science Exhibition may also get a chance to participate in 41st Jawaharlal Nehru National Science Mathematics and Environmental Exhibition for Children 2014 organised by NCERT and may also get a direct entry in the prestigious **National fair (2014) organised by Initiative for Research & Innovation in Science (IRIS)** subject to their selection for both the exhibitions.

The above information may be brought to the notice of all concerned, particularly the science faculty in the school and the students. In case of off-line registration the request for participation along with the enclosed registration form, registration fee and other details may be sent to the above mentioned address before due date. For any other information in this regard, you may contact the **Education Officer, at 2013.scienceexhibition@gmail.com.**

You may also send any specific suggestions or observations in this regard to the undersigned at the above e-mail address.

Regards,

Yours Sincerely

Sd/-
Dr. Sadhana Parashar
Director (Academics, Research, Training and Innovation)

Enclsoure: 1. Details of Sub themes
2. Registration Forms

Copy to below mentioned respective Heads of Directorates/KVS/NVS/CTSA with a request to disseminate the information to all concerned schools under their jurisdiction:

1. The Commissioner, Kendriya Vidyalaya Sangathan, 18-Institutional Area, Shaheed Jeet Singh Marg, New Delhi-110 016.
2. The Commissioner, Navodaya Vidyalaya Samiti, B-15, Sector 62, Insitutional Area, Noida-201309.
3. The Director of Education, Directorate of Education, Govt. of NCT of Delhi, Old Secretariat, Delhi-110 054.
4. The Director of Public Instructions (Schools), Union Territory Secretariat, Sector 9, Chandigarh-160 017.
5. The Director of Education, Govt. of Sikkim, Gangtok, Sikkim – 737 101.
6. The Director of School Education, Govt. of Arunachal Pradesh, Itanagar-791 111.
7. The Director of Education, Govt. of A&N Islands, Port Blair-744 101.
8. The Secretary, Central Tibetan School Administration, ESS ESS Plaza, Community Centre, Sector 3, Rohini, Delhi-110 085.
9. All the Regional Officers of CBSE with the request to send this circular to all the Heads of the affiliated schools of the Board in their respective regions.
10. All Assocaited Professor & Addl. Directors / Assistant Professors & Joint Directors / Deputy Direcotor (Examination & reforms)
11. The Research Officer (Tech.) with the request to put this circualr on the CBSE website.
12. The Joint Secretary (IT) with the request to put this circular on the CBSE website.
13. The Library and Information Officer, CBSE.
14. PS to Chairman, CBSE, Delhi
15. PS to Secretary, CBSE, Delhi.
16. PA to Secretary, CBSE.
17. PA to Professor & Director (Academics, Research Trainign & Innovation) CBSE.
18. PS to Director (Spl. Exams.), CBSE, Delhi.
19. PRO, CBSE

Dr. Sadhana Parashar
Director (Academics, Research, Training and Innovation)

CBSE SCIENCE EXHIBTION 2014

Details of Sub-Themes for preparation of Exhibits and Models

Given below are number of ideas for designing the exhibits on different sub-themes in the context of the main theme. However, these ideas are only suggestive in nature. Participants are free to design exhibits based on other related ideas on the given sub-theme.

Sub Theme-1 **AGRICULTURE**

The main aim of this area is to make our school children and teachers realize the need of studying and removing constraints responsible for inadequate knowledge about rural professions and building capacity and an attitude for innovation for achieving food security.

The exhibits/models in this area may pertain to:

- Studies of climatic change on agriculture;
- Managing crop yield due to climatic change arising from global warming;
- Eco-forestry to protect and restore ecosystem for sustainable forest practices/preserving and enhancing forest biodiversity;
- Preservation and conservation of soil and judicious use of water;
- Conventional biotechnology, practices e.g., application of biotechnology, microbiology, genetic engineering and genomics to agriculture for obtaining improved and high yielding verities;
- Organic farming/organic fertilisers versus chemical fertilisers; biodynamic liquid manure/green manure; Planning and managing energy crops (Salix, poplar, Jatropha, Jojoba etc.);
- Use of biotechnology for economically and ecologically sustainable biofuels;
- Environment friendly measures of pest control;
- Application of biotechnology and genetic engineering in improving animal breeds and production of animal products that are used as food;
- Growing fodders in hydro-ponic environment;
- Innovative/inexpensive/improved/indigenous technologies/ methods of storage/preservation/conservation/transport of agricultural products and food materials;
- Innovative/improved practices for reducing cost of cultivation;
- Growing plants without seeds;
- Identification of medicinal plants and their applications;
- Effect of electric and magnetic fields on the growth of plants and protective measures;
- Sugar levels in plant sep at different times and dates;
- Genetic variations among plants;
- Factors affecting seed germination;
- Best conditions for mushroom production and growth of ferns;
- Tropisms in plants and growth hormones etc.;
- Indigenous designs of farm machinery, agriculture implements and practices;
- Impact of pollution on food;
- Application of biotechnology and genetic engineering to agriculture for improved and high yielding varieties;
- Improved/improvised method of processing, preservation, storage and transport of animal products;
- Ecologically sustainable farming methods;
- Harnessing of animal products keeping environmental concerns;
- Identification of medicinal plants and their applications;
- Schemes/designs to help reduce production cost and conservation of raw materials;
- Plans for proper management of natural resources and environment;

- Strategies to eliminate food insecurity;
- Issues related with the animal health and food security;
- Food production and demand of quality food and food security;
- Advantages and disadvantages of genetically modified (GM) food;
- Nutrition education/healthy eating habits and food utilisation by body;
- Pepping/mulching for weed management and root development in soil; etc.
- Devices to control and measurement of the noise, air, soil, water pollution;
- Preservation, conservation and management of soil;
- Analysis of soil samples for their components;
- Ecological studies of plants and animals;
- Experiments with biodegradability;
- Study and recording varying water levels, over the years in the water body and surrounding environment;
- Design and development of an automatic weather recording device;
- Ozone destruction experiments; etc.

Sub Theme - 2 **ENERGY**

This area is expected to make children think of various ways and means for making efficient use of available energy resources and also new techniques/methods of using and conserving energy from both conventional and nonconventional sources. The exhibits/models in this area may pertain to:

- Various ways of harnessing geothermal energy such as energy from hot springs/ geothermal desalinization/geothermal heating – controlling heating and cooling of a building using underground heat by vertical/horizontal loops/geothermal power/electricity generated from naturally occurring geological heat sources;
- Models of green building/environment friendly building which can harvest energy, water and materials;
- Green roof technologies/roof mounted solar technologies such as solar water heater, solar lighting system;
- Heating system of a building by solar heater;
- Models/innovative designs of domestic hydroelectric generator;
- Devices to make breeze funneling towards your home;
- Methods of heat retention in materials/ heat control in the design of house;
- Solar cooker/solar distiller/solar dryer for food processing/solar heated houses;
- Solar thermal electricity/community solar project;
- Innovative designs and installation of solar tower;
- Hybrid solar lighting (solar illumination by routing daylight into the interior part of the building by reflecting a focused beam of sunlight on the end of optical fiber cables);
- Studies of variation in sunshine intensity at a given place for developing indigenous method of its usage etc;
- Projects for measuring availability of solar/wind energy in a given area;
- Model of wind turbine for domestic use with vertical/horizontal axis;
- Designs of low noise wind farm;
- Wind mill/water mill for grinding grains/drawing water from the well and to generate electricity;
- Water sensitive urban design to mitigate water shortage;
- Water crisis management;
- Use of tidal waves/ocean currents/salinity gradient for generating electricity;
- Wave energy from oscillating water conversion/tidal barrage generator etc;
- Energy from biomass such as seaweeds, human/animal wastes, keeping in view environmental concerns;
- Improvised technologies for effective usage of bio-fuels;
- Innovative designs of bio gas/bio mass plant;

- Bio diesel from plant oils (obtained from canola, palm oil, micro algae oil, waste vegetable oil etc);
- Low cost liquid fuel (bio-ethanol, biomethanol from cellulose biomass by improvising conversion techniques);
- Bio energy for poverty alleviation;
- Impact of bio-energy on food security;
- Models/designs of fuel-efficient automobiles/machines;
- Innovative designs of internal combustion engine which can function on various bio fuels;
- Production of electrical energy from mechanical energy/nuclear resources;
- Mechanism of extraction, storage and processing of fossil fuels
- Study of air tides;
- Effects of landscaping and architecture on energy consumption etc.

Sub Theme - 3 **HEALTH**

The main objectives of this area are: to bring awareness among the youth about health and factors affecting our health, to explore new scientific, technological and bio-medical interventions in prevention and cure, to analyze the role of self and society in keeping our environment healthy in order to maintain good health and promote innovative ideas for better management.

The exhibits and models in this area may pertain to:

- Models demonstrating various levels of good health and ill health;
- Demonstration of factors affecting the health, different ailments in the body;
- Showing and designing activities on infectious and non-infectious diseases, relationship with causative factors and their sources;
- Innovation to develop control measures at different levels/roles of various agencies;
- Presenting medical assistance and facilities, rural/urban and gender aspects;
- Sensitising people to be careful in health matters, explore the possibilities and make use of the facilities available;
- Development of knowledge-base and understand new scientific, technological in bio-medical area;
- Demonstration of means and ways to adopt methods for self concentration and meditation and their uses; Demonstration of known facts and research findings in different medical systems like Indian, Modern, Homeopathy etc.;
- Demonstration of lifestyle and relationship with good and bad health based on known facts and researches;
- Demonstration of the role of traditional knowledge of herbal products for community health; etc.
- Improved methods of sanitation and appropriate technology for waste disposal, both biodegradable and non-biodegradable;
- Common prophylactic measures available and advantages of inoculation and vaccination;
- Need for appropriate measures for family welfare;
- Need for developing low-cost nutritious food;
- General awareness about occupational hazards and innovative techniques to overcome them;
- General awareness about community medicine;
- New medical diagnostic and therapeutic tools;
- Improved aids to visually impaired and physically handicapped persons;
- Need to curb menace of alcohol consumption, drug addiction and smoking;
- Genetic studies; Studies of memory span and memory retention;
- Factors affecting the enzymes' reaction rates etc.
- Developing simple technologies for diagnostics and environmental problems monitoring.

Sub Theme - 4. **ENVIRONMENT**

The main objective of this area is to make general public and children in particular aware about the current environmental issues and concerns for achieving sustainability to prevent the effect of environmental issues. The models and exhibits in this area may pertain to:

- Evironmental issues related with human activities such as agriculture, energy, fishing, forests, mining, shipping, paper, war, occean deoxygenation, dead zone, paint etc.; Evironmental issues with conservation — species extinction, pollinator decline, coral bleaching, Holocene extinction, invasive species, poaching endangered species etc.
- Environmental issues with energy conservation, renewable energy, efficient energy use, renewable energy commercialization etc;
- Environmental controversies such as dam controversies, genetically modified org anisms/food controversy, sealing, dioxin controversy, water fluorination controversy, Endosulfan controversy, POP etc.;
- Environmental disasters such as Bhopal disaster, oil spills, nuclear accidents etc.
- Endocrine disruptors;
- Climate change — global warming, greenhouse gases, fossil fuels, sea level rise, ocean acidification etc.;
- Issues related with environmental health such as air quality, asthma, electromagnetic radiations and fields, lead poisoning, indoor air quality etc;
- Ozone depletion – CFC;
- Environmental effects of intensive farming such as overgrazing, irrigation, plasticulture, pesticides etc.;
- Water pollution — acid rain, marine pollution, Ocean dumping, eutrophication, marine debris, thermal pollution, algal boom, micro-plastics etc;
- Air pollution — smog, ozone, particulate matter, sulphur oxide etc;
- Light, noise, visual, point source and extended source pollution;
- Urban sprawl, habitat fragmentation, habitat destruction;
- Soil erosion, soil contamination and salination, and Waste;
- Aviation and environment;
- Environmental impacts of irrigation, dams and reservoirs;
- GAIA hypothesis and environment protection;
- Environmental implications of nanotechnology (nano-toxiology and nano-pollution).

CBSE REGIONAL LEVEL SCIENCE EXHIBITION, 2014
REGISTRATION FORM

1. Name of the School ----------

2. Complete address (including state)with Tel.no./ Fax/ e-mail ----------
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3. Region ----------

4. Title of the Exhibits/ Projects ----------
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5. Sub-theme of the exhibit (see enclosed information) (i) ----------
(ii) (If applicable)----------

6. Details of registration fee/ draft

Draft Number and dated ----------

Amount and Bank ----------

7. Brief write up of the Exhibit/ Project including

(The complete write-up of the exhibit not to exceed 250 words. It is mandatory to submit the same at the time of registration)

(a) Scientific Principle
(b) Method/ Procedure followed
(c) Unique features of the exhibit
(d) Applications in different domains of life
(e) Further scope of the exhibit/ project

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8. Name of the participant students

a. ----------

b. ----------

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9. Name of the escort teacher (with mobile no.)----------

Principal's Signature_____

Full Name ----------
Mobile Number _____